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AN EMPIRICAL INVESTIGATION OF THE EFFECTS OF SIZE ON STRENGTH OF RELATIONSHIPAND COMMITMENT IN A VIRTUAL COMMUNITY

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Abstract

Although researchers have pointed out relationships among members as being essential for the building of commitment towards a community, there is still insufficient attention placed on this in virtual community research. Furthermore, the effect of size on this relational aspect of virtual community has also been given little emphasis in the existing literature despite being acknowledged by extant research as a critical factor in the building of strong relationships. In an attempt to bridge this gap, we adopt a Social Network approach and use Social Capital Theory as the theoretical perspective to investigate how size, strength of relationship and member's commitment interplay in a virtual community along with the role of information technology on the effects of size. This study is expected to provide a useful framework for practitioners to manage virtual community through management of the size and the relationships among members within the community.

Keywords: Virtual Community, Strength of Relationship, Member's Commitment, Information Technology

1 INTRODUCTION

Virtual Community (VC) has been of particular growth in the recent years (Jones & Rafaeli 2000) due to the exponential growth of the Internet. VCs have been found to be highly supportive and positive experience for members (Rheingold 1993) and companies have been paying great attention to nurture them to increase customers' commitment to their websites (Aschomoneit & Heitmann 2003). In order to increase members' commitment, strong relationship among members is said to be essential (Hagel & Armstrong 1997). Furthermore, according to Leimeister et al.'s (2004) research, members in VCs ranked "encouraging interaction between members" as among the top 10 success factors of a VC. However, till today, there is little empirical investigation to confirm the effect of relationship on members' commitment in the context of VC.

It has been believed that the size of a community plays a critical role in the building of strong relationships either offline or online (Bossard 1945, Hagel & Armstrong 1997, Figallo 1998). Therefore, there have been a number of studies on the effects of size on a VC. However, the focus were mostly in two main areas, namely, 1) the importance of critical mass in making a VC attractive (Markus 1987, Hagel & Armstrong 1997), and 2) the impact of the size on community activities such as information overloading and social loafing (Jones & Rafeali 2000, Butler 2001). Besides, the role of information technology (IT) on the impact of size of a VC has not been investigated.

To understand this building of strong relationship in a VC, the effect of its size on strength of relationship, and the role of IT on the size, this paper attempts to address the following research questions from a Social Network approach, based on the Social Capital:

- What is the effect of size on strength of relationship among members in a VC?
- Does strong relationship among members lead to members' commitment in a VC?
- What is the role of IT on the impact of size of a VC?

2 LITERATURE REVIEW

2.1 Virtual Community

Numerous definitions of VC were proposed by various authors. A review of these definitions (Lee, Vogel & Limayem 2003) found that the most commonly cited definitions are the ones by Rheingold (1993), followed by Hagel and Armstrong (1997), and Jones and Rafaeli (2000) (Table 1).

Author (s)	Definition
1 Rheingold (1993)	Social aggregations that emerge from the Net when enough people carry on public discussions long enough, with sufficient human feelings, to form webs of personal relationships in cyberspace.
2 Hagel and Armstrong (1997)	Are computer-mediated spaces where there is a potential for an integration of content and communication with an emphasis on member-generated content.
3 Jones and Rafaeli (2000)	Are symbolically delineated computer-mediated spaces… allow groups of individuals to attend and contribute to similar set of computer-mediated interpersonal interactions.

Table 1. Three most commonly cited definitions of VC.

Based on the similarities in these definitions, characteristics of a VC can be identified. A VC exists in cyberspace, having its activities supported by computer-based IT. It focuses on communications and interactions driven by participants and emphasizes on the relationship building within the community. These characteristics show the importance of relationship among members in a VC and the role of IT. We will adopt the definition of Rheingold (1993) for this research since it places more emphasis on personal relationship among members in a VC.

A VC can be classified by its orientation (i.e. orientation it takes to cater to target members), content, as well as its uses and goals (Aschmoneit & Hietmann 2003, Hummel & Lechner 2002). In this paper, we focus on social VC and define it as similar to non-work related VC, which emphasizes on social interactions, relationship building and leisure needs of people. In addition, we define social VC to be different from work-related VC that have a specific task or goal to achieve. Examples of social VC are games, entertainment, and special interests community. The reason why the non-work related is chosen over the work-related is because hierarchy usually exists in a work-related community, which may affect the strength of relationships among the members and pose as a possible confounding effect for our study. Furthermore, as a work related community is more goal-oriented and having its members very task-focused, the emphasis placed on social interactivity among members may be lesser as compared to that in a non-work related community (Alavi & Leidner 2001).

2.2 Relationship Development in VC

Relationship development is one of the four needs – information, transaction, fantasy and relationship – driving the formation of a VC (Hagel & Armstrong 1997) and it occurs when members participate and interact with one another long enough with sufficient human feeling, as suggested by Rheingold (1993). However, though participation may lead to relationship development, it does not guarantee the formation of relationship, not to mention strong relationship. If bad experience is encountered during participation and interaction with the others, relationship will not be developed (Wellman et al. 2001). Furthermore, not all users of VC are social-oriented. There are participants who care only about seeking information or engaging in solitary recreations. These people are termed by Figallo (1998) as the "loners" of a community who place very little emphasis on relationship building. Hence, participation does not necessarily lead to strong relationship among members. Moreover, the level of participations of members in a VC may not be a good indicator of the sustainability or success of that VC because the time members invest in the VC may change over time as the VC grows in size and social loafing takes place (Butler 2001). This may lead to an eventual reduction in the level of community activities and hence the VC's values. Despite so, participation or interaction has been used as a surrogate measure of either relationship or sustainability of a VC in previous studies.

However, these limitations may be overcome if we approach relationship in VC from another perspective. It has been argued that relationships among members set the foundations for a VC by helping to solidify commitment to the group and, in turn towards the community (Hagel & Armstrong 1997, Figallo 1998). In addition, with strong relationships, members tend more to return regularly to maintain them and as time passes, shared history is constructed with one another, further strengthening the ties between members and commitment towards the VC (Figallo 1998). For these reasons, we feel that investigation of strength of relationship is a more important aspect of VC compared to participation, as relationships attributes to members' commitment, which is a key contributor of a VC's sustainability (Figallo 1998). However, there has been no empirical study conducted to confirm the importance of strength of relationship in increasing members' commitment towards a VC.

2.3 Effects of Size

Size poses a challenge and threat towards interaction opportunities in both offline and online community (Bossard 1945, Figallo 1998). Since relationship is developed through quality interactions among members, one of the key factors affecting relationship among members is therefore its size. In the context of offline community, most studies highlighted the negative effects of size on interpersonal communication and relationship in an offline community (Table 2).

Author(s)	Findings
Astley (1985)	Interconnections among members become increasingly fragile with a continued increase in size of membership
Sundstrom et al. (1990)	Problems of communication and coordination among members increase with increasing group size.

Alexander et al. (1996)	Size affects the cohesion and harmony of a team negatively.

Table 2. Past findings showing the negative effects of size in offline community.

In the context of VC, the findings are controversial. On one hand, some studies argued size to be a contributor of attractiveness (Markus 1987, Hagel & Armstrong 1997), retention of members and sustainability of a VC (Butler 2001). On the other hand, increasing size is said to result in the occurrence of lurkers and social loafers (Jones & Rafaeli 2000, Butler 2001), and is found to negatively affect members' level of participation and involvement in a VC (Rothaemel & Sugiyama 2000), as members find it harder to maintain a sense of intimacy with one another (Hagel & Armstrong 1997). In the case study conducted by Rothaemel et al. (2000) on TimeZone, in addition to their findings on participation and involvement, members also reported formation of cliques and unfriendliness of groups towards new members as the community increases in size. Though this study contributes to literature of the effects of size on relationship in a VC, the nature of this research brings forth a limitation of generalizability, as the study is conducted on TimeZone, hence causing findings to be specific to only TimeZone context and may not be applicable across other VCs. Furthermore, unlike an offline community whereby members communicate through face-to-face meetings, VC is supported by IT infrastructures, which are expected to reduce the negative effects of size on communication (Draft & Lewin 1993). Despite so, the study on TimeZone and other VC studies (e.g. Zhang & Hiltz 2003) did not investigate the role of IT.

In summary, the findings in a VC context are controversial and the role of IT is not clear. Although there were studies investigating the effects of size on participation in a VC, the strength of relationship is different from participation and is, in fact a more important aspect to examine in the context of VC, as we have established earlier in this paper. However, there has been no empirical study on the effects of size on the strength of relationships among members in a VC. Therefore, to fill this research gap and to overcome limitations in past studies, investigatigation on the effects of size and the role of IT in relation to the strength of relationship in a VC is truly necessary.

3 RESEARCH MODEL AND HYPOTHESES

To investigate this effect of size on the strength of relationship and member's commitment along with the role of IT, we adopted the Social Capital Theory from a social network perspective as the theoretical backbone for this paper.

3.1 Social Capital Theory from a Social Network Perspective

The term "Social Capital" was initially introduced in community studies to highlight the importance of networks of strong personal relationships developed over time that provide basis for collective action in communities (Jacobs 1965). Social capital can exist in more than one dimensions and forms. Particularly, structural dimension (Nahapiet & Ghoshal 1998) and the different forms (i.e. bridging and bonding) (Adler & Kwon 2002) of social capital emphasize more on the importance of social ties among members of a community. Structural dimension refers to the overall pattern of connections between actors while the different forms of social capital refer to the social capital inhering in the ties among actors. Therefore, to better mirror the focus of our study, we combine these aspects of social capital and, define social capital as an asset leveraged through social relations within a VC.

However, the use of social capital is constrained by factors like time, which is needed for the maintenance of stronger ties (Granovetter 1973); and social distance, which would cause the likelihood of reciprocity of social capital to decrease (Harary, Norman & Cartwright 1965). Because of these constraints, there exists an upper limit to the number of ties formed in a collectivity (i.e. an aggregation of actors bound together for the sharing of social capital) resulting in a maximum collectivity size and a plateau in the accumulation of social capital. Size of a community, therefore,

affects the accumulation of social capital. Furthermore, as social capital is mobilized via the social relations in a community, the extent and strength of relationships formed among the members will thus determine the possible amount of resources leveraged by each individual. In addition, community commitment is important because when members have strong attitude towards their community, they will mobilize their social capital more willingly and effectively (McAdam 1982). However in a VC context, unlike that in an offline context whereby mobilization of social capital is likely to be dyadic, resources leveraged via ties would likely be transmitted through its IT infrastructure, whereby information is posted publicly on the forum board. As a result, some of the social capital residing only on ties may become public resources, belonging to the VC. Hence, public resources are additional resources to social capital, but which belong to a collectivity (Lin 2001)

From a Social Network perspective, based on the Social Capital Theory, a research model is proposed (Figure 1) to investigate the effects of size and the strength of relationships on a VC. We shall now explain the hypotheses in detail.

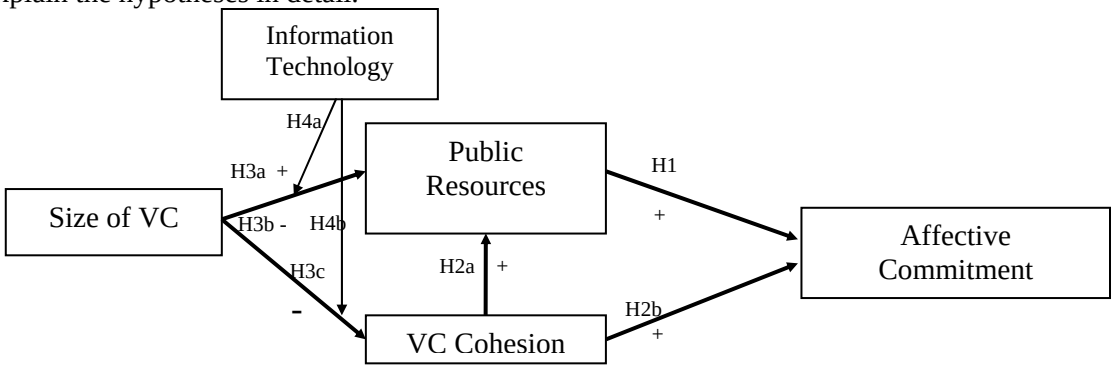

Figure 1. Research Model and Hypotheses

3.2 Affective Commitment and Public Resources

According to past commitment studies, commitment construct has at least two components, namely affective and continuance commitment (Allen & Meyer 1990). Affective commitment is built on the "affective or emotional attachment" to a community (Allen & Meyer 1990), while continuance commitment can be high due to binding actions like investments and contracts. As our study focuses on social VC, which usually does not involve any form of monetary investments or contracts, we use the "affective commitment" construct to represent member's involvement in a VC.

Public resources are defined as resources that are publicly available to all members in a VC and can be referred to as material, information exchanged (Wellman & Gulia 1999), and knowledge shared among members in a VC. According to the Social Exchange Theory, self-interested actors transact with others to accomplish individual goals that they cannot achieve alone (Lawler & Thye 1999) and they usually make exchanges when they have the incentive to do so. Since members of a VC place great importance on the collective information generated (Chan et al. 2004), and are able to achieve them by staying committed, they will therefore see it as beneficial to be committed in a VC that provides them with better opportunities to acquire the public resources.

Hypothesis 1: The more available the public resources in a VC, the higher will be member's level of affective commitment.

3.3 VC Cohesion

The concept of cohesion is a multidimensional construct, which encompasses dimensions like peer relations, group cooperation, and friendliness and warmth (Koys & DeCotiis 1991). For our research, we adopt both Seashore's (1954), and Koys and DeCotiis's (1991) definitions of cohesion, modify and

define it as “the perception of togetherness in human relations and sharing within the community setting, including the willingness of members to provide material aid”. Social Capital Theory states that the stronger the ties among members, the more likely the sharing and exchanges of resources (Lin 2001) and according to the Social Network Theory, whatever is to be diffused can reach a larger number of people when all small groups or cliques are socially tied to an integrative whole (Granovetter 1973). Furthermore, development of social relationship is another interest, in addition to acquisition of public resources, which members seek for when they join a VC (Zhang & Hiltz 2003).

Hypothesis 2a: The stronger the VC cohesion, the more available will be the public resources in a VC.
Hypothesis 2b: The stronger the VC cohesion, the higher will be the member’s level of affective commitment.

3.4 Size of VC

On the one hand, based on the Resource-based model by Butler (2001), the number of members in a VC is indicative of the resources available in a VC. However, on the other hand, Butler (2001) found that as a collectivity grows in size, there might eventually be occurrence of social loafing leading to unavailability of resources. Furthermore, the social distances among members increase with size. According to the structural theory in the social network research, there exists a critical social distance, beyond which communication become difficult thereby decreasing the likelihood of reciprocity of resources (Harary et al. 1965). In addition, when a collectivity grows beyond its threshold size, there is an eventual competition for time and attention among members within a collectivity, which leads to fragmentation of loyalty, and in turn will endanger the identity and continued existence of the community as a whole (Coleman 1986). As size goes beyond a certain threshold, no additional social ties will be formed which may worsen the togetherness in a VC.

Hypothesis 3a: The larger the size of a VC, the more available will be the public resources in a VC.
Hypothesis 3b: The larger the size of a VC, the less available will be the public resources in a VC.
Hypothesis 3c: The larger the size of a VC, the weaker will be the VC cohesion.

3.5 Information Technology

However, the negative effects of size on communication are expected to reduce alongside the use of IT (Draft & Lewin 1993). In an offline community, members communicate through face-to-face meetings whereby co-presence of members is required. This causes the problems of conflicting temporal requirements and scarcity of temporal resources (McGrath 1991), which are further aggravated by size. In a VC, IT used to support VC activities is characterized as a potentially fast and efficient mean of communication (Lea & Spears 1991), and is also perceived by users to be of greater geographical reach (Dryer et al. 1999). Therefore, with IT, possible costs and distortion incurred from communications across large social distances are reduced and a provider of social capital will be more motivated to provide information and help as he is more likely to be rewarded or to receive support in return now. In addition, with IT, members can have more frequent and simultaneous interactions and communications, which span over a wider geographical scope than those in an offline community. IT thus allows for more efficient usage of temporal and spatial resources. We hence argue that scarcity of such resources will be reached at a later time in a virtual as compared to an offline community. With that, we posit more social ties can be formed, resulting in a larger threshold for size of a collectivity before togetherness in a VC falls apart.

Hypothesis 4a: IT moderates the relationship between size of VC and level of public resources such that the threshold for negative association between the two variables is larger than that in an offline community.
Hypothesis 4b: IT moderates the relationship between size of VC and VC cohesion such that the threshold for negative association between the two variables is larger than that in an offline community.

4 RESEARCH METHODOLOGY

To test the proposed research model, we will adopt the cross-sectional survey method as the main method for data collection. The unit of analysis for this study is an individual. The measurement will be a web-based questionnaire with items adapted from existing measures validated by other researchers. To measure VC cohesion, items are adapted from measures by Koys and DeCotiis (1991), and Seashore (1954). The instrument for measuring the member's level of affective commitment is taken from questionnaires developed by Allen and Meyer (1990) and Mowday, Steers and Porter (1979). The items for Intention to Stay are modified from items measuring Behavioural Intention (Azjen & Fishbein 1980), while those for Public resources will be adapted from measurements for availability and relevance of information. Size of VCs is represented by the total member population in the VC and the role of IT is measured with items measuring members' level of IT usage in a VC. The sample population for this study is the online communities and forums. A URL will be posted as a thread in VCs, for members' access to the questionnaire via the link.

5 EXPECTED CONTRIBUTIONS

This study will help organizers of a VC to understand the importance of size and the strength of relationship towards increasing the level of commitment in a VC. As such, this paper can aid organizers to devise plans and strategies to better retain members and ensure VC's long-term viability.

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